

REMARKS

Applicant requests reconsideration and allowance in view of the foregoing amendment and the following remarks.

The amendment to the specification inserts a new abstract that is within the 150 word limitation. A number of claims are amended to correct misspellings including one identified as occurring in claim 15 which actually appeared in claim 22.

Claims 1 and 22 are amended to make express features of the invention that are inherent in the invention as originally claimed. The features include the relationship between the images of the target and the resolution of the optical system. In the invention the claimed zones are within the resolution limits of the optical system. As will be shown below, Chen and others rely upon sub-resolution features for detecting aberration. Sub-resolution figures are not themselves resolved by the respective systems in which they are used.

The invention is not shown or suggested by the Chen application or The Chen patent 6,753,954. The invention is not shown because the claims provide that the image of the target is resolved on the photoresist; Chen does not resolve the image on the photoresist. The invention is not suggested by Chen because Chen expressly teaches away from resolving the image on the photoresist. Chen teaches the opposite of the invention. In the invention, each zone is resolved on the photoresist.

Chen requires sub-resolution features 12. The resulting images of Chen are shown in his Figs. 5(a), 6(a) and 8 (e,f,g,h). In every instance the sub-resolution features are not shown in the image. Chen intentionally uses features that cannot be resolved by the optical system. In effect, Chen uses multiple sub-resolution features to generate a close figure that is used to evaluate aberrations. In contrast, the invention relies upon a target of an open figure with resolvable zones.

The references of Omura (US 2003/0147061), Lee (US 2003/0203319), Fukuhara (US 6,839,132) and Wristers (US 6,552,776) are combined with Chen to reject one or more dependent claims. However, those references, alone or in combination, do not make up for the deficiencies of the Chen reference. Lee also relies upon sub-resolution features. As for Fuduhara, even when combined with Chen it does not provide a central phase zone because Chen teaches away from a phase zone in the center of the target. Note that the inner ring 14 of Chen is

part of the printed structure and is not a separate, central feature. In Chen the annulus defined by 15 and 14 has sub-resolution features 12 between the borders 15, 14. There is no central feature.


Claims 4 and 5 are patentable over Chen combined with Lee. Claims 4 and 5 define a range of sizes of zones and spacing between zones based on the relationship of wavelength and numerical aperture. In that range, the zones are resolvable. Neither Chen nor Lee teaches such sizes and such spacing to achieve resolution. Lee merely states that the resolution limit of a system is its wavelength and then shows how to use a diffraction pattern of sub-resolution features to image lines and spaces smaller than the wavelength. If Lee could image the lines and spaces directly, it would and there would be no need for sub-resolution features. Lee is not directed toward detecting and measuring aberrations.

In contrast, the invention uses the combined features of shapes and spaces in the ranges of claims 4 and 5 to resolve the features onto photoresist and thereby detect aberrations. Note the claimed relationship between the wavelength and the numerical aperture is not shown or suggested in Chen or Lee in the claims as originally filed.

Having thus distinguished the invention from the art of record, Applicant believes the application is now in condition for allowance and a notice of allowance is requested.

Respectfully submitted,

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